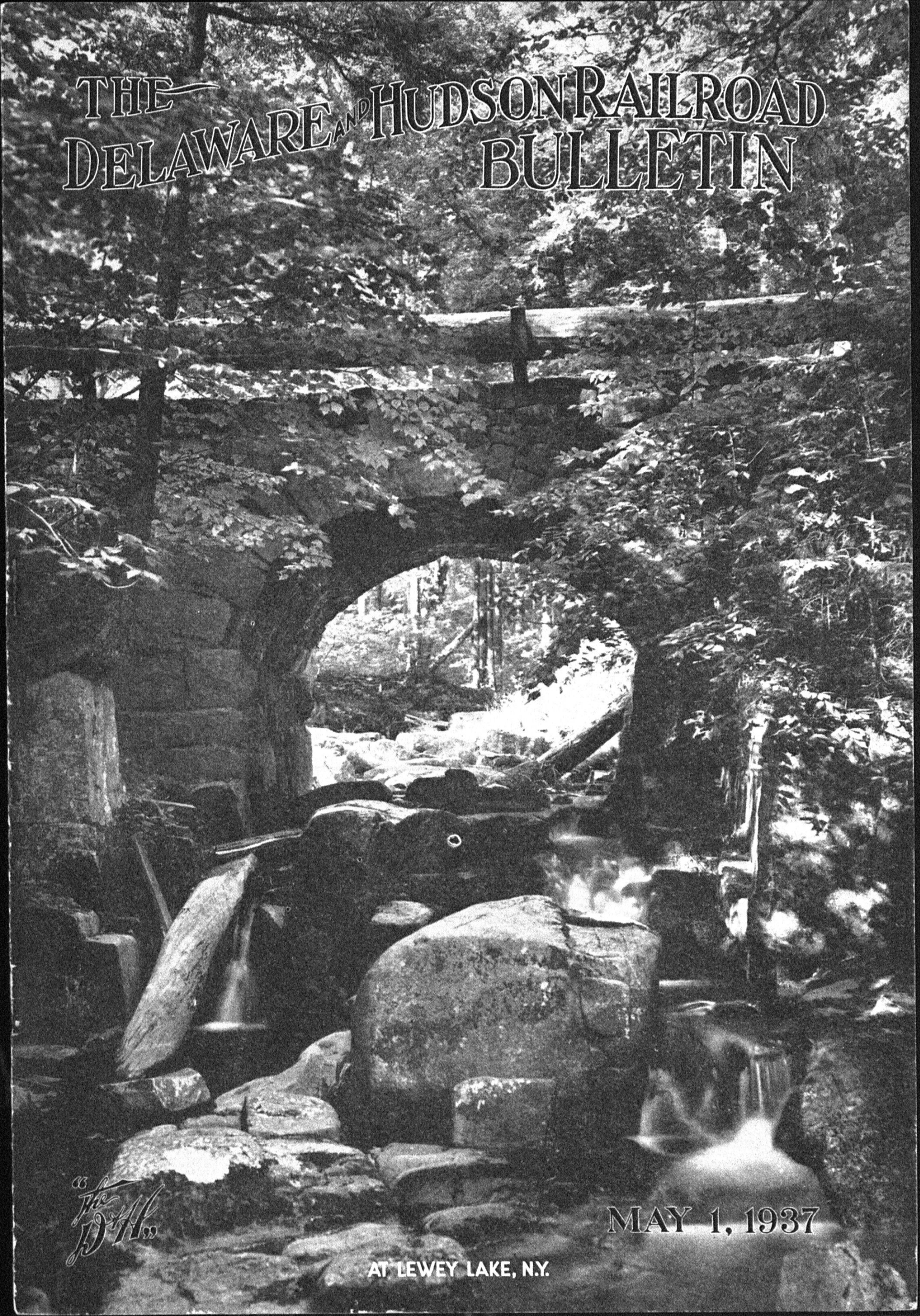
THE DELAWARE AND HUDSON RAILROAD BULLETIN



"The D&H"

MAY 1, 1937

AT LEWEY LAKE, N.Y.

Age and Youth

YOUTH takes its joys from hopeful dreams
Of future prizes to be won;
Of voyages on unknown streams,
In realms beyond the rising sun.

But Age, reflective Age, delights
E'en in the twilight's dying rays
In turning to the joyous sights
Of long forgotten Yesterdays.

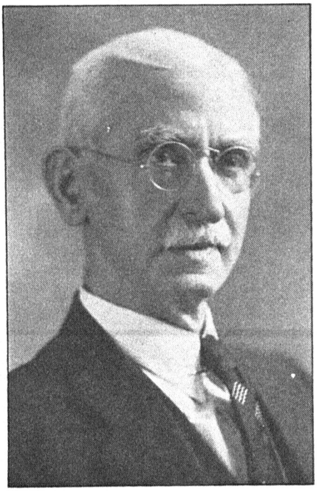
I know not which more joy imparts,
Which hath the sweeter taste, the page
That tells of hope in youthful hearts,
Or tender memories of age.

—JOHN KENDRICK BANGS.

The
DELAWARE AND HUDSON RAILROAD
CORPORATION
BULLETIN

Forty Years at the Throttle

Most of Veteran's 53-year Railroading Career Spent as Engineer



PETER E. BECKER

WHEN the Wilkes-Barre–Green Ridge way freight arrived at the latter point in the late eighties, the crew frequently found every square inch of the freight house platform occupied by less-than-carload shipments which they would have to load into box cars, says retired ENGINEER PETER E. BECKER, who fired on that run for some time. Wagons, piled high with additional parcels, would be waiting in the adjacent driveways until space was cleared for the drivers to deposit their loads. There were seven factories at Green Ridge then, all of which made heavy rail shipments daily: an iron works, a glass factory, a drop forge mill, a bottle stopper plant, two breweries, and a lace factory, reputed to have been the first in this country, having been moved here from England. Just about the time the trainmen thought they had reached the bottom of the pile, the wagons would begin to arrive with their second loads. Shipments were proportionately large at the other stations on the line.

Freight was loaded at the larger terminals without regard for the order in which the parcels would have to be removed from the car. Consequently it was frequently necessary to virtually empty a car to find a lone package which had been stowed away in a far corner. When the contents were replaced they were loaded systematically so that the freight for each station was nearest the door when its destination was reached. Although the entire run was only twenty miles long, it took them about twelve hours to get over the road in slack times and as much as nineteen hours when business was brisk.

MR. BECKER was born at Ghetto, a little anthracite mining town near Hazelton, Pa., September 20, 1863. He first went to school at the age of four, the term lasting only from September 1 to January 31. In Plymouth, where the family moved the following year, there was a three-month term in the winter and another in the summer. As soon as he was eight years old he spent the balance of the year as a breaker boy, mule driver, or ventilating door tender in the mines.

At that time the Delaware and Hudson was represented at Plymouth Junction by Willard Hickok, who bore the titles of yardmaster, dispatcher, and southern sales agent. Beginning in 1884 Mr. Hickok frequently called MR. BECKER to work as brakeman on the railroad when one of the regular men laid off. There were two locomotives stationed there then, Nos. 26 and 29, named *Colonel Cannon* and *James R. Taylor*, respectively, both of which were used to haul coal from Plymouth to Mill Creek, now Hudson, running over Delaware and Hudson tracks to South Wilkes-Barre, via the Central Railroad of New Jersey to Parsons, thence to Mill Creek over our own line.

In 1886 MR. BECKER became a regular brakeman under Conductor Sherman D. Brown, frequently serving in the latter's place or as extra fireman. The next year he became Engineer Dennis Arnold's regular fireman, on locomotive No. 25, the *R. L. Kennedy*, later firing for Engineer John Hallett on the Wilkes-Barre–Green Ridge way freight already mentioned.

In 1893 Master Mechanic C. A. Rettew promoted MR. BECKER to the rank of extra engineer, although he continued to fire the way freight most of the time. Beginning in 1896 there were so many calls for extra engineers that he never fired a locomotive again. When he became a regularly assigned engineer in 1898 he was given a night yard engine at Wilkes-Barre where he continued for four years.

In 1902 MR. BECKER took a mine run out of Plymouth Junction, going to Yatesville regularly and occasionally as far north as Carbondale. When, in November 1903, freight runs were extended through to Oneonta, MR. BECKER pulled Nos. 49 and 50, with engine No. 249, a double-cab consolidation type. These were both time-freights: the company received $1 per car when the trains operated on time and forfeited a similar amount when they were late.

One day they left Oneonta with three cars of ore over their tonnage. They lost time at Nineveh with a broken drawbar and more at Jefferson Junction packing a hot engine truck box. By that time the division offices were wiring for explanations of the delays. When finally under way, they broke records climbing the mountain to Ararat, raced down the other side and on to Wilkes-Barre, arriving several minutes ahead of time. After that they heard very little about delays from Carbondale.

Running those fast freights was not without its thrills and excitement. One trip they started down the hill from Ararat going north when MR. BECKER lost the air on all but the engine and the first five cars of his train. Sending the head brakeman back to set hand brakes, he applied the air as frequently as he dared and finally got stopped at Stevens Point. Just as they stopped two driving wheel tires dropped off and all the others were loose. Investigation showed that an air hose had become frozen, cutting off the supply to the balance of the train.

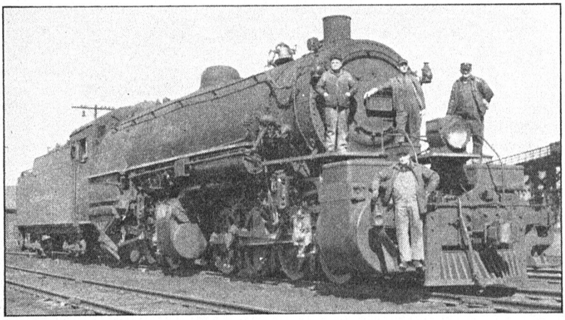
In 1904 MR. BECKER took a Wilkes-Barre yard job, serving also as extra passenger engineer; for four years beginning in 1913 he handled passenger trains between Wilkes-Barre and Carbondale; he went back to the yard in 1917; returned to passenger runs in 1918; and bid in a day yard job at Wilkes-Barre in 1924, remaining for twelve years until pensioned, August 1, 1936.

MR. BECKER is a Mason, a member of The Delaware and Hudson Veterans' Association, and the Wyoming Valley Motor Club. He and Mrs. Becker live at 53 North Washington Street, Wilkes-Barre, spending the summers at his camp at Holcomb's Grove, Pa.

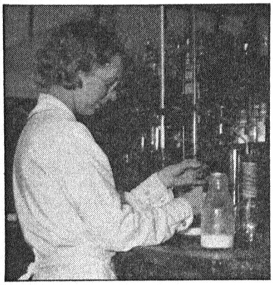
His Job

"You don't make very good music with that instrument," said a bystander to the man with the bass drum as the band ceased playing.

"No," admitted the man, "I know I don't; but I drown a heap of bad music."



Mallet 1612 ready to push freight train from Carbondale to Lanesboro



Research in Milk

Milk Sugar, Vitamins, Glue or Plastics — Bainbridge Makes All

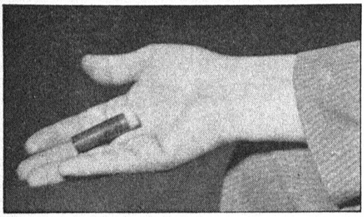
Borden Laboratories and associated plants have developed thousands of products made from milk.

A GREATER variety of milk products and derivatives is produced in the village of Bainbridge, N. Y., than in any other community in the world, regardless of size. They range from pure vitamin G, which has a value of thousands of dollars per ounce in this pure form and which is difficult and costly to extract, to a million button blanks a day, and further include dry milk, milk sugar, water-proof glue, belt buckles, pencil and fountain pen barrel stock, and hundreds of other plastic products. This wide variety of items is made in four plants owned by The Borden Company: The Biological and Chemical Research Laboratories, where newly developed products are turned out on a small scale while commercial quantity manufacturing technique is being perfected, and where a staff of chemists and biologists is constantly investigating the complex character of milk for developing new knowledge upon which new products will be produced for commercial distribution several years hence; The Dry Milk Company; The National Milk Sugar Company; and The Casein Company of America, Inc. A fifth, The American Plastics Company, is part Borden-owned.

Many discoveries which have had a profound effect on human life all over the civilized world have been made in the Research Laboratories at Bainbridge. One of these is the application and perfection of the process of irradiating milk with intense ultraviolet rays for the purpose of imparting vitamin D to milk in much the same manner as the body gets its vitamin D from exposure to bright sunlight. The milk so treated will prevent the bone disease known as rickets in growing infants and children, and may even cure this disease under many conditions. The principle of irradiating food was discovered simultaneously by Dr. Alfred F. Hess, of New York, and Prof. Harry Steenbock, of Wisconsin University, in 1924. The perfection of the process and its application to milk was completed in the Research Laboratory at Bainbridge in 1925 and the first commercial milk irradiation process in the country, if not in the world, was started in The Dry Milk Company plant early in 1927. The basic principle of food irradiation was patented by Prof. Steenbock. The process patent as applied to milk was patented by Dr. G. C. Supplee, Director of the local Laboratories and Associate Director of Research for The Borden Company. The Supplee milk irradiation patent was assigned to and is owned by The Borden Company.

Milk is irradiated by exposing it for one second or less to high intensity ultraviolet light, produced by special carbon arc light, as it flows before the light in thin films. Infants and children who are fed irradiated milk develop healthy bones and there is some evidence that healthy teeth may result from irradiated vitamin D milk; whereas, a serious deficiency of vitamin D results in rickets, awkwardly bowed legs, knock knees, or other skeleton deformities. Several thousand quarts of irradiated vitamin D milk are consumed in New York City daily, and the consumption of irradiated milk throughout the United States amounts to several hundred million quarts per year.

A comparatively recent achievement of the Bainbridge Laboratories, and possibly one more spectacular, was the development of the process and commercial method for isolating pure vitamin G, the third vitamin to be isolated in pure form, known scientifically as lactoflavin, and popularly as the "growth vitamin." This vitamin is essential for all animal life; lactoflavin promotes the growth of body cells and the animal organism which does not receive an adequate amount of lactoflavin fails to grow, and if lactoflavin or vita-



Vial contains Vitamin "G" worth $250

min G is entirely absent death results after a period of time. Within the past year, scientific evidence has been developing which indicates that lactoflavin may play a part in the prevention of cataract, a malady which if uncorrected leads to blindness. Vitamin G is found in many food products but milk and whey as well as other milk derivatives are recognized to be some of the richest sources of this life sustaining and growth promoting substance.

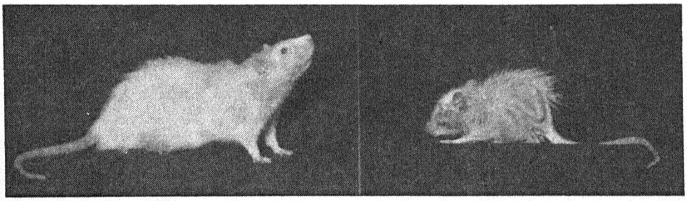
The process of producing vitamin G or pure lactoflavin from milk was perfected in the Bainbridge Laboratories which are now engaged in the production of the pure crystalline material, in which form it exists as brilliant yellow or orange satin-like threads or needles. To produce a single gram of the pure vitamin, substantially 16,000 quarts or 32,000 pounds of milk are required. However, the material representing this amount of milk is not employed for the production of the pure vitamin until the cream, casein, or cheese, and the sugar of milk have been removed. While the vitamin is very dilute as it exists in milk, only extremely small amounts are needed by the animal body for growth promotion. Such amounts are so small that they are usually spoken of as billionth of a gram or ounce. To date the greater part of the pure vitamin is used by hospitals, laboratories, and pharmaceutical houses for further research and experimentation. A patent has been applied for covering the process of recovering pure vitamin G from milk, as worked out by the Bainbridge Laboratories.

Of equal interest is the system developed at Bainbridge for measuring the amount of vitamin G in a given substance. The test sample is first reduced to fluid form, after which it is exposed to "black light," the invisible rays in the ultraviolet region of the spectrum. Under this light the solution will flouresce or show a golden yellow glow, which in appropriate concentrate and in a completely darkened room, may yield sufficient light to enable one to read by. Black light will reveal the presence of vitamin G down to one part in 20 million.

At present the laboratory staff is experimenting with other products extracted from milk in an effort to recover from milk and its derivatives the utmost of value for the promotion of general nutrition and for the complete and fullest utilization of all components of milk at the lowest possible cost, thereby through creative work constantly extending the market for milk and the numerous products or derivatives which may be obtained from it by the newly developed processes.

Research has led the way to the point where every component of the milk has an actual or potential use, with the exception of the water and some of the water soluble minerals, chiefly salt, which it contains. When a new product or process is developed in the Bainbridge Laboratories it is kept in the Laboratory until perfected and remains under Laboratory supervision and guidance until quantity production is routinely established at the particular plant of The Borden Company best adapted for the commercial production of the product.

One of the world's largest privately owned rat colonies is maintained at the Laboratory for experimental purposes. The vitamin D content of milk is tested with rats which have been fed an appropriate diet entirely lacking in vitamin D for a period sufficient to develop pronounced rickets.



Effect of lack of Vitamin "G" shown by condition of "twin" rats

Varying amounts of vitamin D, as for example irradiated milk or other vitamin D carrying materials are then fed to the sick animals. At the end of a given test period the animals are killed with an anesthetic, and a microscopic examination is made of the bone to determine the degree to which the vitamin D in the test substance has brought about a cure of the rickets. A relative rate and degree of cure of rickets in experimental animals serves as a basis for determining the amount of vitamin D which the test substance contains.

Tests for vitamin G or lactoflavin are conducted on similar lines. The experimental animals are fed substances containing various amounts of lactoflavin. Those which receive no lactoflavin suffer a loss of fur, fail to grow, become emaciated and ultimately die; those which receive lactoflavin in appropriate amounts grow at a rate commensurate with the amount of lactoflavin fed.

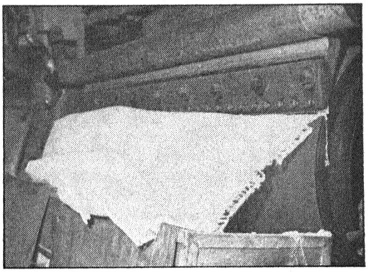
Vitamin A is likewise investigated with rats. A deficiency of this vitamin in the diet causes characteristic soreness of the eyes, respiratory infection and other characteristic manifestations as well as failure to grow.

The maintenance of the rat colony for rearing the animals used in the experiments is carried out with precision and regularity as regarding scheduled breeding, selections of appropriate breeding stock and the weeding out of inferior animals. Likewise, the feed of the animals used for breeding purposes must be maintained very uniform and with maximum nutritional qualities in order to assure regular and satisfactory breeding performance and uniformity in physical characteristics of the young required for experiment.

By the time this article is printed the Biological and Chemical Research Laboratories at Bainbridge will be housed in larger and more modern quarters, in which still new avenues of milk, nutritional and engineering research will be pursued. The scientific staff is interested in many applications of physical principles and the application of new engineering and scientific achievement in fields other than the milk industry only.

Dry Milk

Ten thousand pounds of dry milk, used principally by the baking industry, are produced daily in the Bainbridge plant of The Dry Milk Company. Long ago bakeries, especially in densely populated areas, found that it was very difficult to get liquid milk of uniform quality. During cold weather it was not always possible to get sufficient quantity and as warm weather approached milk often became contaminated, making the production of baked goods difficult if not impossible. Furthermore, in some baking processes, the use of liquid milk resulted in too fluid a dough. These problems led to the thought of concentrating milk so as to preserve its original characteristics for long periods of time.



Dry Milk in sheet before being broken up in powder form

Since milk is made up of protein, milk sugar, mineral matter, and fat, held in suspension and in solution by water, it was realized that in order to preserve the milk, it was necessary to remove most of the water. Experiments resulted in the development of several different processes of making condensed milk, with 40 per cent of sugar added as a preservative, and dried or powdered milk. Dried milk has the double advantage of being lighter than the condensed product, hence cheaper and easier to transport, and it is more easily mixed in the bakery.

Dry milk is produced at Bainbridge by what is known as the film process. The milk supply is stored in glass-lined steel containers, which are surrounded by a jacket of brine, designed to keep the contents at a low temperature. With its cream or butter fat content controlled to maintain a given standard in the finished product, the milk is piped to the drying machines. These consist of two steam-heated steel drums, or rollers, which revolve toward each other and between which the milk falls. The intense heat causes the almost instant evaporation of the milk's water content and the residue or solids remain on the rollers from which they are removed by means of a knife. In appearance the milk now resembles an endless sheet of creamy-white tissue paper, falling into a large metal bin. The thin sheets are then broken up and sifted into the finely powdered finished product, which is shipped in wooden barrels with double paraffin liners. Sterilization of the plant and machinery at the close of each day's operation requires as much time as is devoted to actual manufacturing.

(Continued on page 75)

What's Under Your Hood?

AS long as an automobile keeps up its marvelous performance, you probably think little about the engine that hums quietly under the hood. You are scarcely aware that there is an engine because of the very smoothness and regularity with which it does its work. Then something suddenly goes wrong. There is engine trouble. The car ceases to perform smoothly. Difficulties follow. You begin to realize what that steady performance has meant to your comfort and safety.

Your Engine

Your body is a little like that car. Within there is a powerful engine, the heart, which makes possible a smooth, steady progress through life. As long as this engine keeps pumping steadily, you forget it exists. Only when it ceases to do perfect work do you appreciate what a remarkable piece of machinery it has been.

Just consider the heart for a moment. Though only about the size of a man's fist, it does an astonishing piece of work. It pumps fifty gallons of blood an hour. It never sleeps, never loafs, never takes a vacation from the beginning of life to the end. The only rest it ever gets is between beats.

And yet with all the work it has to do, the strong heart does not give out suddenly, unless it has been injured or ill-treated. It cannot, however, be expected entirely to withstand the strain of continuous over-exertion, or the repeated attacks of germs or poisons, and the possibly weakening effects of disease.

Give Your Heart a Chance

Heart disease is frequently preventable. What should one do to keep the heart healthy?

1. *Go to the docotor* every year for a health examination, and follow his advice. This suggestion applies to children as well as adults. *After a serious illness,* have the doctor give your heart a thorough examination. Then return to active life as carefully and slowly as possible so that your heart will have plenty of time to rest from the strain.
2. *Look after infected teeth or tonsils.*
3. *Go to the dentist* regularly.
4. *Keep your weight near the average,* for a person of your age, sex and height.
5. *Have a well-balanced diet* and do not overeat.
6. *Do not take headache medicine* without consulting your doctor. Advertised cures for headaches may contain drugs that are harmful to the heart.
7. *Consult your doctor* about the use of tobacco and stimulants.
8. *Live a well-rounded life.* Exercise regularly but stop before you are over-tired.
9. *If you have children, consult a doctor* whenever one of them complains of even mild leg ache or pains in the joints.
10. *Watch your child after he has had one of the "children's diseases" or any serious illness,* especially rheumatic fever, diphtheria, scarlet fever, or measles. Have the doctor examine him before he goes back to school. Care at this time may prevent serious trouble later. Early use of antitoxin in treating a case of diphtheria will help save the heart from injury. (But why allow a child to have diphtheria at all when toxin-antitoxin will absolutely prevent it?)

The Feel of Success

THE line that divides pain from joy is extremely fine. You have to get close to pain before you experience pleasure. For instance, food tastes best when you are hungry. The $5 bill which is found on the street by the penniless man exults him more than the $50,000 profit made by the man who already has a million dollars.

Human beings are hard to satisfy. The father who seeks to spare his children all struggle thereby deprives them of the zest of life, because joy is the product of victory over obstacles. The mistake that fathers make is in thinking that economic independence is the source of happiness. The source of happiness is the fight and the winning of independence. The man who becomes economically independent through his own efforts, and has won out in a hard game, enjoys the feeling of security in contrast with his early sense of insecurity and weakness.

The feel of success and victory is one of the most delightful of all sensations, and unfortunately, no father, though he be as rich as Rockefeller, can pass this on to his son.—*Bagology.*

Home-Owning Made Easy

Government's Insured Mortgage Plan Explained

THE Insured Mortgage System of the Federal Housing Administration has made it possible for thousands of citizens with low incomes to buy homes on a sensible, safe, long-term basis. Under this system they can pay for their homes in monthly installments of about the same as they usually spent in rent, over a period as long as 20 years.

The Federal Housing Administration has established a system that protects the borrower as well as the lender and opens up a straight road to debt-free home ownership.

To apply for a loan a prospective home builder or home buyer goes to a bank, building and loan association or other financial insitiution approved by the Federal Housing Administration, or to the local Housing Administration insuring office which will put him in contact with an approved financial institution. The officials of the bank or financial institution will gladly listen to his proposal or plans for the buying or building a home. They will explain and assist him in the preparation of an application, credit statement or other necessary papers. If, after investigating his application, they decide to make the loan the whole proposal is turned over to the Federal Housing Administration for approval.

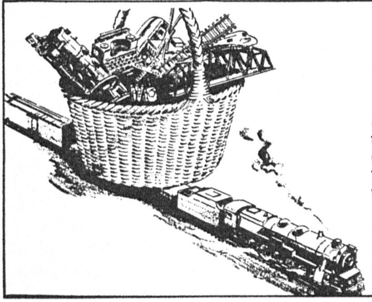
Under this system, any man having a steady income and a reputation for paying his bills, can borrow from a bank or other financial institution approved by the Federal Housing Administration, up to 80 percent of the appraised value of the property (house and lot), provided the total mortgage does not exceed the limit of $16,000. The Federal Housing Administration lends no money but insures the mortgage secured by the property.

In other words, a man who can afford to pay $35 a month rent would be able, if he had $1,000 for the down payment, to purchase a $5,000 house under the Insured Mortgage System. The monthly payments over a 20 year period would be about $29.08 which would include a portion of the principal, interest on the money borrowed, the cost of servicing the mortgage, leaving the balance of the $35 for the monthly share of taxes, insurance and maintenance, which vary in every community.

In considering a man's application for a loan, the Housing Administration's underwriters look after his interests as well as the lender's and the Government's. They determine whether the applicant for the loan has an income sufficient to warrant his building or buying a home of the value contemplated, for the Federal Housing Administration will not insure a mortgage if it believes that repaying the loan will consume so much of the borrower's income as to cause doubt of his ability to meet other current living expenses.

The plans, specifications and the estimates are carefully scrutinized, for the Administration insists that the home shall be well planned and constructed of good material by competent workmanship. The location of the home is also carefully

(Continued on page 78)



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The
Delaware and Hudson Railroad
CORPORATION
BULLETIN

Office of Publication:
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PUBLISHED MONTHLY by The Delaware and Hudson Railroad Corporation, for the information of the men who operate the railroad, in the belief that mutual understanding of the problems we all have to meet will help us to solve them for our mutual welfare.

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Who Thinks For *You*?

STEINMETZ, the electrical wizard whose name ranks with that of Edison and other great leaders of the industry, had the habit of taking nothing for granted. In the classroom the fact that a professor stated a thing to be true did not convince Steinmetz. Not until he had tested the truth of the statement to his complete satisfaction would he accept it.

As a result of his refusal to accept the opinions of others without further proof, Steinmetz later discovered errors in the work of some of the greatest scientists, as the result of which much of the fundamental theory of electricity was completely changed.

Today, as never before, we are faced with the necessity of proving everything. Too much has been taken on faith, believed because it was stated to be so by some "authority." False propaganda is being spread on a world-wide basis. The old admonition to believe nothing that you hear and only half of what you see was never more to the point.

As one example of the successful use of propaganda to make people believe an untruth, we have the general idea that railroad passenger revenues have greatly increased since fares were reduced by order of the government. While it is true that more people are riding the trains, it must be remembered that 15 must now ride where 10 were found before in order to yield any increase in revenue. Because of this, the apparently great increase in passenger travel has actually meant a smaller percentage increase in passenger receipts than has occurred in freight revenues due to the improvement in business conditions. What passenger revenues would have been at the old rates is thus a matter of conjecture. The railroads are in much the same position as the elephant in the old story. The elephant and the flea happened to cross a bridge at the same time. When they were again on solid ground the flea remarked, "We sure did shake that bridge!"—which is the technique of the modern propagandist.

The Bulletin has always urged its readers to do their own thinking, not adopting the "if you see it in the *Sun* it's so" attitude. It does try to be correct as to statements of fact upon which its readers may base their own conclusions. Unfortunately, too many of us feel that we have too much else to do, so we let someone else do our thinking without testing the accuracy of their reasoning. It is as a result of this attitude that great civilizations have fallen in the past, over-run by those who were not too "busy" to think.

It Produces Results

THE Old Sage pulled the "horse and buggy" over to the side of the road into the shade and stopped.

"I have been wondering," he said, "if the system that has produced oranges so cheap and plentiful that they have become almost a daily breakfast diet in every family, instead of being a special gift passed out at the Church Christmas Tree as when I was a kid—

"Or the same system which has made it possible to produce 104 barrels of gasoline from 100 barrels of crude oil, whereas only a few years ago the take was only five barrels of gas—

"Or has built a tire with a mileage of 20,000 miles instead of 3,000 as they used to do—

"Or is able to build a car which sells for $650.00 which could not have been bought twenty years ago for $3,000.00—

"Or has produced such an efficient electric lamp that if replaced with the old-style carbon lamps of thirty years ago would cost the public $5,000,000.00 a day more—

"As I was saying, I can't help but wonder, that this system which has created or improved 200,000 products by research in the last 25 years, that not only sell for less, thus saving people money to spend for other things, but have also added comfort and convenience for everyone; if allowed to continue will not come closer to giving us more economic liberty and social security, etc., than all the 'isms' and legislation, and bureaucratic regulations that are coming out of Washington.

"Well, I guess we had better get going, or the folks will think the old horse and buggy is on a sitdown strike. Giddap!"—*Power & Light News.*

Japanese Railroad Rules

THE traditional note of Japanese courtesy is emphasized in the new regulations issued by the Railway Department:

(1) It is objectionable for one person to occupy a seat for two, especially when the train is crowded, by putting a package beside him or by having a friend who came to see him off sit beside him until the train starts.

(2) It is an especially bad practice to pretend to be asleep when the guard tells you to make room for other passengers.

(3) Parents will be grateful if a child is given a seat. It is also commendable to assist older people. On the other hand, aged passengers should not force others to help them.

(4) Dirty clothing makes it unpleasant for others in the car.

(5) Women should refrain from changing their clothing in a train.

(6) Passengers in groups who sing at night are not welcome.

(7) People should be quiet in a sleeping car. They should not go into other cars, especially the dining car, in a night dress.—*American Mercury.*

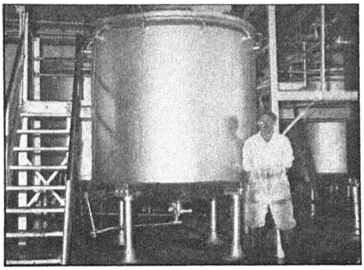
Enthusiasm

IF you can't get enthusiastic about your work, it's time to get alarmed—something is wrong. Compete with yourself; set your teeth and dive into the job of breaking your own record.

No one keeps up his enthusiasm automatically. Enthusiasm must be nourished with new actions, new aspirations, new efforts, new vision. It is one's own fault if his enthusiasm is gone; he has failed to feed it.

Right here is the big reason why thousands of men hit high watermarks at thirty-five and then recede. They can "do their work with their eyes shut," and that is the way they do it. They have lost their driving power of enthusiasm. They sleep at the switch. All they see in life is the face of the time clock. All they hear is the quitting whistle.

If you want to turn hours into minutes, renew your enthusiasm.—*Papyrus.*



Milk Storage Tanks

Milk Sugar

(Continued from page 71)

A large portion of the milk sugar produced annually in the United States is recovered in the Bainbridge plant of The National Milk Sugar Division of The Borden Company.

Milk sugar is a pure carbohydrate present in the milk of all mammals, cow's milk containing from 4 to 5 pounds per 100.

The complicated process of extracting the sugar from milk begins with the separation of the butter fat which is sold as cream or is made into butter, ice cream, or other dairy products. The skim milk which remains is treated with acid or rennet to precipitate the casein, the amount of which varies between 2½ and 3 pounds per 100. At this stage the whey which remains contains lactalbumin, sugar, and salts. The lactalbumin is next removed by heat and chemical treatment and is used in the preparation of chicken and animal feeds.

The liquid which remains is then subjected to heat and vacuum treatment to remove water and the sugar is crystalized out. The crystals are next put through a centrifugal machine in which the salts, being more soluble, are thrown out, leaving crude lactose or milk sugar. Following a further refining process, similar to that used in the production of cane or beet sugar, milk sugar results, forming the purest animal carbohydrate known to science.

Milk sugar is less soluble than cane sugar, therefore is much less sweet to the taste; however, it is not fermentable, a very important factor in the preparation of baby foods.

The principal use of milk sugar is to modify cow's milk for infant feeding. It is also used as a sweet coating on pills and as a carrier for drugs to be administered hypodermically. In other words, a minute quantity of morphine, strychnine, or other drug is mixed with sufficient milk sugar to form a pill which is dissolved in a liquid by the doctor and injected into the patient with a hypodermic needle. Milk sugar is also used in the production of explosives, tracer bullets, and smoke screens, practically the entire product of the plant having been used by munitions makers during the World War.

Ordinary milk sugar is known chemically as alpha-lactose; recently a new type, called beta-lactose, which is more soluble and sweeter to the taste, was developed.

The Bainbridge plant also produces a vitamin-free casein which is used as a basal ration in animal tests. By introducing measured amounts of vitamin-bearing preparations into animals' diets, their effect can be observed.

The milk sugar produced in the Bainbridge plant is sold in wholesale lots to chemists and manufacturers who package and market it under their own trade names.

The plant is the successor to the world's first milk sugar manufactory, which was established at Bainbridge in about 1880 by Mr. A. A. Bennett, father of the present vice-president and production manager.

Casein

All of the casein produced in the milk sugar plant, as well as much from other firms in this country and abroad, is sent to the Casein Company of America's Bainbridge plant where it is used in making a water-proof glue and prepared casein for manufacture into plastic articles in other plants.

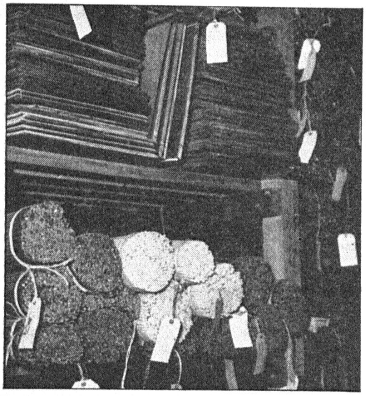
The word casein is derived from the German word "kase," which means cheese, and it may properly be termed the cheese content of milk. As was briefly outlined in the account of the manufacture of milk sugar, skim milk is run into large vats and is either allowed to sour naturally, or the souring is speeded up by the addition of a small quantity of dilute acid. To further speed souring, the temperature of the skim milk is raised to about blood heat, and when this is done, the separation into curds and whey occurs quickly. The curd, which is crude casein, is thoroughly washed and is then put into a press which removes some of the water. The pressed curd is broken into small particles and the remaining water removed in a drying apparatus. The temperature of the crude casein has to be carefully controlled in order that the adhesive property of the finished casein is not harmed. The dried material is ground to various degrees of fineness, according to the requirements of particular industires.

Except for water-proof glue, The Casein Company of America makes no finished products in its Bainbridge plant. Crude casein is processed in this establishment and is turned out in various grades and sizes, ranging from powdered to granulated. It is then shipped to other manufacturers for further processing.

The firm's water-proof glue, sold under the trade name "Casco," is made by taking the ground dried casein and blending it, often with casein from South America, Europe and New Zealand to achieve uniformity. Various chemicals cause it to dissolve easily without lumping in cold water, and control its viscosity and its liquid "life" for a certain number of hours. In other words, the length of time the glue will remain in a liquid state before hardening can be controlled chemically, the interval varying from a few hours to more than a day.

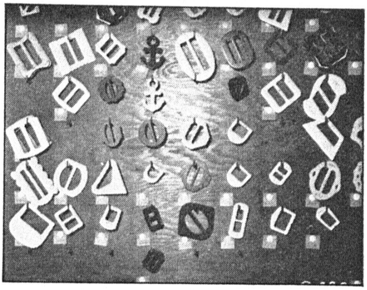
Inspecting Buttons, American Plastics Corporation

Casein glue has little, if any competition in the water-proof glue field. The mast of the America's Cup defender *Enterprise*, for instance, was made up of hundreds of pieces of high grade spruce, held together by Casco glue. Seven other boats, which competed with the *Enterprise* for the honor of defending the cup, had masts ranging from 164 to 168 feet long, all made in the same manner. These tapering masts were all hollow, with a hole sufficiently large that a man could enter at the base and crawl upward for over 100 feet inside, and had to be strong enough to withstand a pressure of 170,000 pounds at the base in a brisk wind, yet they were held together solely by glue made at Bainbridge. Much of the glue produced is used in the fabrication of airplanes, the world's largest wood propeller, measuring 16 feet from tip to tip, having been held together with Casco.



Casein sheets and rods are made in various sizes and colors

Probably the largest use for casein today is in the manufacture of coated paper, all of that made in the United States being prepared with casein. The various pigments like clay, satin white and colors are mixed into a pulp with the water, the casein is dissolved into a sizing and then mixed with these clays and colors and the coating so prepared is run on the machines which coat the mixture onto the paper. The paper is then run through finishing machines to give it the bright, smooth effect needed for lithograph work, candy boxes and the like.



Novelties made from milk

Various casein combinations are also used in the leather trade, in the manufacture of oil cloth, in the finishing of carpets, silks and print coatings.

Very large quantities are used in the manufacture of casein cold water paints, both in powder and paste form, and great amounts of a high quality go into the manufacture of casein-plastics which are used in the production of buttons, beads, buckles and various other articles.

Casein is also used in connection with milk of rubber which comes from the plantations of the Far East. This milk of rubber is combined in various ways with small amounts of casein to protect the rubber films. Numerous rubber goods manufactured today contain a small amount of casein as a protecting agent introduced during the various manufacturing processes.

Casein of a special grade is used in a limited way in special foods like diabetic food preparations and medical products.

Plastics

The American Plastics Corporation, which is part Borden-owned, carries the manufacture of casein one step further, but does not turn out any finished products. It produces rods, tubes and sheets of casein, as well as button blanks and other rough shapes for finishing in other plants.

The casein comes to this plant from producers of milk sugar and other manufactories in the United States, Europe and Australia in powdered to granulated form. It is mixed with chemicals which turn it into a plastic, dyes producing any desired plain color or pattern except clear water white. This plastic is then put through machines in which heat and pressure are applied to form it into rods or tubes. Sheets are made by pressing short rods to the required length, width, and thickness. Most of the sheets are then cut into discs for later molding into buttons or other shapes.

After the casein has been shaped it is immersed in a hardening bath of formaldehyde, in which it remains for from four days to one year, depending on the thickness and shape. When hardened the casein is put in dryers under strict temperature and humidity control to evaporate excess moisture. It is then shipped out to customers who complete its manufacture into articles of commerce. Unlike one of its competitors, celluloid, casein is not inflammable.

The plant's product is shipped to factories in the United States, Canada, Cuba, and Australia.

House-Owning Made Easy

(Continued from page 73)

considered—whether it is of a type that fits its environment whether there are schools and adequate transportation facilities; if water, gas and electricity are at hand. In fact every factor is considered to protect the home buyer's investment in his home.

In the case of a man building a home under the Insured Mortgage System, the interest of the underwriting office does not end with the approval of the loan. To see that the minimum requirements are carried out and the house is built according to specifications, the building is inspected during and upon completion of construction.

When the Federal Housing Administration insures a mortgage on a home, the owner has the satisfaction of knowing that his home is honestly constructed, in a substantial neighborhood and that he has every reasonable chance of owning it outright at the end of the period for which the loan is made.

Obeyed the Rule

A young man called at the house of a famous specialist and asked to see the doctor.

"Have you an appointment?" asked the nurse.

"No, I haven't."

The nurse consulted the doctor's appointment list. "I think I can let you see the doctor after the next patient leaves," she said, "so please take your clothes off."

"Take my clothes off? What for?"

"The doctor has made it a rule not to see anyone unless this is done," the nurse said.

"Well, if that's the case, I'm game," the young man said.

A few moments later the doctor entered the room and found the young man awaiting him in "the raw." "Well, sir," the doctor said, "what seems to be the trouble?"

"Doctor," the young man replied, "I called to see if you would renew your wife's subscription to the Ladies' Home Journal?"

That Kind!

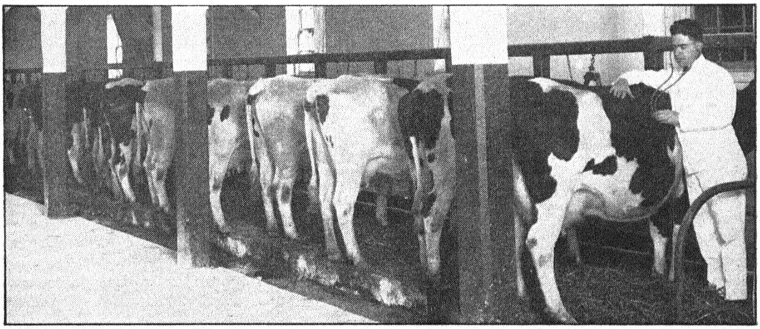
Little Tommy was running errands for his sister. Among the requirements were some from the druggist.

"I would like a box of powder for my sister," said the boy.

"Certainly," replied the druggist, and thinking to have a joke, he added, "Some that goes off with a bang?"

But Tommy was equal to the occasion.

"No," he answered brightly, "the kind that goes on with a puff."



Clicks from the Rails

A Cat is on the Payroll

of the M-K-T at the Garland, Tex., freight house. "Tabby" is far from attractive in appearance but since she was presented to the agent two years ago she has eliminated loss and damage claims caused by rats which formerly ranged from $5 to $20 a month. With claim reports as evidence the agent sought and obtained authority to put the cost of bread and milk for "Tabby" on his expense sheet and thus gave her the distinction of being the only cat employe of the railroad.

✣

Seven Giraffes,

crated in open-ended boxes which gave full play to their long necks, were shipped by Railway Express from Boston to zoos in Philadelphia, Cincinnati, St. Louis, New York, and Royal Oak, Mich., thus completing the long journey from Tanganika, East Africa. Despite the fact that these odd creatures are extremely delicate and require careful attention at all times, they reached their destinations in perfect condition.

✣

A Weed-Killing Train

has been operating with great success on the German State Railways for some years. The unit consists of eight old locomotive tenders filled with a chemical weed killer, connected with a pipe, the last tender including the control compartment and nozzles which spray a curtain of the killer across and several feet to each side of the rails.

✣

"Honesty Boxes,"

into which passengers can deposit fares which the conductor is unable to collect because of congestion on the cars, have been installed in vehicles in Bournemouth and Glasgow. During their first week in Bournemouth over $40 was deposited in them.

Night Train Service

is generally taken as much for granted as that which goes on by light of day. Yet the first night passenger train ever run in Netherland India, or the Dutch East Indies, began operating on November 1, 1936. Known as the *Java Night Express*, it runs a distance of about 500 miles between Batavia and Surabaya between 6:30 P. M. and 7:30 A. M. Curiously enough, this modern innovation was introduced as the railroad's answer to the airplane, with which it expects to compete successfully since the air trip requires three hours of the business day to cover the distance between the two cities.

✣

Pictures in Bottled Sand

are the hobby of John Adams, Southern Pacific switchman. The sand, obtained from Picture Rock, Iowa, in 27 different shades, is so placed in the bottles that it forms a multi-colored picture under the glass. The sand is poured in with a long-handled spoon and is tamped in solid with hickory sticks to prevent shifting. When the painstaking task is completed — it takes 45 hours to "paint" a pint-sized picture—the bottle is sealed with plaster of Paris. He recently gained much publicity with his picture of the streamliner *City of San Francisco* and an old locomotive in a single jar.

✣

Missing the Train

is a minor tragedy that may never occur again if the service being tried experimentally at Sterling, Ill., proves successful. Any Chicago & Northwestern patron who wishes to catch the 6:17 A. M. train may telephone the station agent the night before and be assured that he will be called just one hour before the train arrives, whether it is late or on time. If successful, the service may be extended to other cities.

A Train Derailment

was prevented by the prompt and heroic action of a Norfolk and Western railroader's wife. During a heavy rain she saw an embankment cave in, precipitating a mass of rock and dirt upon the tracks on the far side of the Levisa River. Knowing that a train was due, she plunged into the turbulent river, made her way across, and flagged the train just in time. But for her the train would undoubtedly have struck the landslide.

✣

Free Pillow Service

has been inaugurated in the coaches of several Southern Pacific trains. That road recently ordered 7,000 pillows, 32,200 pillow slips, 6,500 blue covers and 380 pillow pouches, at a total cost of $10,000. Every available source of chicken feathers was tapped to supply the 14,000 pounds needed. As one writer put it, no local hen was safe, even in the privacy of her own back yard, till the last pound of feathers had been purchased.

✣

Grain in Tank Cars

is the latest experiment of the Russian railroads. During the summer months, as in this country, a large volume of oil products moves by water, leaving a surplus of tank cars on hand. The capacity of these being twice that of ordinary Russian freight cars, it has paid to clean them out for grain movement, loading and unloading being 85 per cent mechanical.

✣

Snow Cleaning Machines

built by the Russian railroads require only two men for their operation. They will clean a mile of track in 15 minutes, clearing a path 16 feet wide from which the snow is removed by a conveyor to flat cars where it is compressed to about a quarter of its former bulk.

The True Optimist

THE true optimist is not the one who from the side lines smiles on disaster, who insists that all's well with the world. It is the man who, with hopeful heart and cheerful energy, puts his shoulder to the wheel when it is bemired, and with undaunted spirit rallies the weary and despondent to renewed endeavor.—SELECTED.